Remarks

Claims 1-20 are pending in the application. Claims 1-7, 11-16 and 20 are rejected. Claims 8-10 and 17-19 are objected to. Claims 1-10 and 12-19 are amended. All rejections and objections are respectfully traversed.

Claims 1-5, 7-10 and 12-19 are objected to because of informalities. Claims 1-5, 7-10, 12-19 are amended to overcome these objections. No new subject matter is added.

Claim 6 is amended to correct a clerical error. No new subject matter is added.

Claims 11 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

The Examiner asserts, "*the specification while related to the reception of an OFDM signal does not enable one of skill to modulate an OFDM signal.*" OFDM modulation has been known since at least 1966, as evidenced by the seminal paper on the subject by R.W. Chang, "Synthesis of Band-Limited Orthogonal Signals for Multichannel Data Transmission", *Bell Syst. Tech. J.,* vol.45, pp. 1775-1796, Dec. 1966. Since OFDM modulation techniques are so very well known by those of ordinary skill in the art of communications systems, the applicants provided an enabling description as background. The Examiner is directed to page 1, line 8 through page 2, line 10 of the specification, below:

--Orthogonal frequency division multiplexing (OFDM) is a signal modulation technique in which a transmitter divides a signal, and then transmits the divided signal over several subcarriers. The subcarriers are located on a frequency axis at regular intervals. With the OFDM technique, in contrast with conventional serial communication techniques, the transmitted signal is divided into *N* streams, and the *N* stream are then transmitted in parallel over *N* subcarriers, each having a separate carrier frequency. The OFDM technique transmits the signal reliably and efficiently at a high data rate.

The subcarriers are made "orthogonal" by appropriately selecting the spacing of the frequencies in the frequency band. Therefore, spectral overlapping among subcarriers is allowed because the orthogonality ensures that the receiver can separate the OFDM subcarriers. With OFDM, a better spectral efficiency is achieved than by using a simple frequency division multiplexing technique. OFDM is more robust to data loss due to multipath fading when compared with a single carrier because OFDM has an increased symbol period for the same aggregate data rate.

In addition, inter-symbol interference (ISI) in OFDM transmissions can be prevented by inserting a guard interval before each transmitted block of symbols. Moreover, OFDM is robust to frequency selective fading because each sub-channel occupies a relatively narrow frequency band, where the characteristic of the channel frequency is relatively flat. Thus, OFDM is used by many communication systems, including digital audio and video broadcasting (DAB, DVB), and high-speed digital subscriber line (DSL)

modems over a twisted pair of wires. OFDM can also be used in wireless local area networks (WLANs), and fixed broadband wireless communication networks.--

Further, an explicit description of an OFDM transmitter is provided in Figure 1 and the Detailed Description of the Preferred Embodiment at page 6, line 19 through page 7, line 11, below:

--Figure 1 shows a baseband equivalent representation of an OFDM system 100 that uses the invention. In a transmitter of the OFDM system 100, input binary data symbols X 101 are fed into a serial to parallel (S/P) converter 110 to produce parallel data streams. Each parallel data stream 111 is then modulated (Mod) 120 to corresponding sub-carriers 121 using, for example, MPSK or MQAM modulation techniques. Modulation schemes can vary on the sub-carriers in order to achieve a maximum capacity or a minimum bit error rate (BER) under some constraints. We describe the invention in terms of fixed modulation, e.g., QPSK or 16QAM, on all of the sub-carriers 121. However, it should be understood that the invention could be applied to any modulation scheme.

The modulated symbols, represented by complex variables $X(0),\cdots,X(M-1)$, are transformed by an inverse fast Fourier transform (IFFT) 130. The transformed symbols are denoted as $x(0),\cdots,x(M-1)$. In order to avoid inter-symbol interference (ISI), a cyclic prefix (CP) is added 140 in front of each symbol. The CP replicates the end part of the previous IFFT output symbol. The length of the CP is longer than the channel length L. The parallel data

are converted (P/S) 150 to a serial data stream 105, which is transmitted over a frequency selective fading channel 102.--

As shown above, a person of ordinary skill in the art would readily be able to modulate a signal according to OFDM modulation after reading the specification and drawings. Therefore, the Examiner is requested to reconsider and withdraw the rejections.

Claim 1-7, 11-16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bao et al. (U.S. Patent Publication No. 2002/0150037).

Claim 1 is amended to include the limitations of allowable claim 10. Claim 12 is amended to include the limitations of allowable claim 19.

The Examiner is reminded that the undersigned Applicant's representative spoke by telephone with the Examiner on September 2, 2005, and explained that allowable claim 10 as originally filed erroneously depended from claim 9, where it should have depended from claim 1. This was a clerical error. The Applicants representative pointed to independent system claim 12 and allowable dependent system claim 19 which depended directly from claim 12. Claims 12 and 19 are the system counterparts of method claims 1 and 10. Therefore, claim 1 is amended to include the limitations of claim 10 only, and not intervening claim 9, because the originally filed dependency of claim 10 from claim 9 was an error.

It is believed that this application is now in condition for allowance. A notice to this effect is respectfully requested. Should further questions arise concerning this application, the Examiner is invited to call Applicant's attorney at the number listed below. Please charge any shortage in fees due in connection with the filing of this paper to Deposit Account 50-0749.

Respectfully submitted,
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